

IN THE CLAIMS:

Claims 10, 15, 16, 18, 19, and 21-32 are amended herein. Claim 34 is added. All pending claims and their present status are produced below.

1 1. (Original) A tunable capacitive bridge configured to couple a ladder network
2 comprising coupling elements and a plurality of shunt elements, the tunable capacitive bridge
3 comprising:

4 a first tunable capacitor coupled in parallel with a coupling element, a first end of the

5 first tunable capacitor coupled with a first shunt element and a second end of

6 the first tunable capacitor coupled with a second shunt element; and

7 a second tunable capacitor and a third tunable capacitor coupled in parallel with the

8 first tunable capacitor,

9 a first end of the second tunable capacitor coupled with the first end of the

10 first tunable capacitor and the first shunt element, and

11 a first end of the third tunable capacitor coupled with the second end of the

12 first tunable capacitor and the second shunt element.

1 2. (Original) The tunable capacitive bridge of claim 1, wherein the second end of the
2 second tunable capacitor couples with a ground.

1 3. (Original) The tunable capacitive bridge of claim 1, wherein the second end of the
2 third tunable capacitor couples with a ground.

1 4. (Original) The tunable capacitive bridge of claim 1, wherein the first tunable
2 capacitor comprises a thin-film barium strontium titanate ("BST") capacitor.

1 5. (Original) The tunable capacitive bridge of claim 1, wherein the second tunable
2 capacitor comprises a thin-film barium strontium titanate ("BST") capacitor.

1 6. (Original) The tunable capacitive bridge of claim 1, wherein the third tunable
2 capacitor comprises a thin-film barium strontium titanate ("BST") capacitor.

1 7. (Original) The tunable capacitive bridge of claim 1, wherein each of the first tunable
2 capacitor, the second tunable capacitor, and the third tunable capacitor comprises a thin-film
3 barium strontium titanate ("BST") capacitor.

1 8. (Original) The tunable capacitive bridge of claim 1, wherein at least one shunt
2 element comprises a reactive element.

1 9. (Original) The tunable capacitive bridge of claim 1, wherein at least one shunt
2 element comprises a small section transmission line.

1 10. (Currently amended) A tunable capacitive bridge configured to couple a ladder
2 network comprising a coupling element coupled ~~in parallel~~ with a shunt element, the tunable
3 capacitive bridge comprising:

4 a first tunable thin-film barium strontium titanate ("BST") capacitor coupled in
5 parallel with the coupling element ~~and the shunt element~~; and

6 a second tunable thin-film BST capacitor and a third tunable thin-film BST capacitor
7 coupled ~~in parallel~~ with the first tunable thin-film BST capacitor, ~~and the~~
8 ~~coupling element and the shunt element~~

9 a first end of the second tunable thin-film BST capacitor coupled with a first
10 end of the first tunable thin-film BST capacitor, and

11 a first end of the third tunable thin-film BST capacitor coupled with a second
12 end of the first tunable thin-film BST capacitor.

1 11. (Original) The tunable capacitive bridge of claim 10, wherein the coupling element
2 comprises one of a resonant and a non-resonant element.

1 12. (Original) The tunable capacitive bridge of claim 10, wherein the coupling element
2 comprises at last one from a group consisting of a capacitor, inductor, a resistor, and a
3 transmission line.

1 13. (Original) The tunable capacitive bridge of claim 10, wherein the shunt element
2 comprises at least one from a group consisting of a capacitor, an inductor, a resistor, and a
3 transmission line.

1 14. (Original) The tunable capacitive bridge of claim 10, wherein the second tunable
2 thin-film BST capacitor and the third tunable thin-film BST capacitor couple with a ground.

1 15. (Currently amended) The tunable ~~capactive~~ capacitive bridge of claim 10, wherein
2 the shunt element couples with a ground.

1 16. (Currently amended) A tuning circuit comprising:
2 a bridge circuit comprising

3 a first adjustable capacitance grouping coupled between a first node and a
4 second node,

5 a second adjustable capacitance grouping coupled between the first node and a
6 third node, and

7 a third adjustable capacitance grouping coupled between the second node and
8 the third node,

9 wherein each adjustable capacitance grouping ~~comprising~~ comprises at least
10 one tunable capacitor coupled between a one of the nodes associated
11 with that grouping and a bias port; and

12 a first lead coupled to the first node and a second lead coupled to the second node, the
13 leads configured to couple the bridge circuit with a coupling element coupled
14 between the first node and the second node and with and a shunt element
15 coupled to a first end of the coupling element.

1 17. (Original) The tuning circuit of claim 16, wherein the tunable capacitor comprises a
2 thin-film barium strontium titanate ("BST") capacitor.

1 18. (Currently amended) The tuning circuit of claims 16, wherein at least one of the
2 adjustable capacitance ~~groups~~ groupings further comprises a bulk capacitor coupled between
3 an other of the nodes associated with the grouping and the bias port.

1 19. (Currently amended) The tuning circuit of claim 18, wherein the tunable capacitor is
2 set to a value substantially equivalent to the bulk capacitor in that adjustable capacitance
3 ~~group~~ grouping.

1 20. (Original) The tuning circuit of claim 16, wherein the bias port is configured to
2 receive a bias voltage.

1 21. (Currently amended) The tuning circuit of claim 20, wherein the bias port further
2 comprises a bias resistance coupled between the tunable capacitor and the bias voltage.

1 22. (Currently amended) A tuning circuit comprising:

2 a bridge circuit comprising

3 a first adjustable capacitance grouping coupled between a first node and a
4 second node,

5 a second adjustable capacitance grouping coupled between the first node and a
6 third node, and

7 a third adjustable capacitance grouping coupled between the second node and
8 the third node,

9 wherein each adjustable capacitance grouping ~~comprising~~ comprises at least

10 one tunable thin-film barium strontium titanate ("BST") capacitor

11 coupled between a one of the nodes associated with that grouping and

12 a bias port, the bias port configured to couple a bias voltage; and

13 a first lead coupled to the first node and a second lead coupled to the second node, the
14 leads configured to couple the bridge circuit with a coupling element coupled
15 between the first node and the second node and with ~~and~~ a shunt element
16 coupled to a first end of the coupling element.

1 23. (Currently amended) The tuning circuit of claim 22, wherein at least one adjustable
2 capacitance ~~group~~ grouping further comprises a bulk capacitor coupled between an other of
3 the nodes associated with the grouping and the bias port.

1 24. (Currently amended) The tuning circuit of claim 23, wherein the tunable BST
2 capacitor is set to a value substantially equal to a value of the bulk capacitor in that
3 adjustable capacitance ~~group~~ grouping.

1 25. (Currently amended) The tuning circuit of claim 22, wherein at least one adjustable
2 capacitance ~~group~~ grouping further comprises a second tunable thin-film BST capacitor
3 coupled between an other of the nodes associated with the grouping and the bias port.

1 26. (Currently amended) The tuning circuit of claim 24 25, wherein the second tunable
2 thin-film BST capacitor is set to a value substantially equal to the ~~first~~ at least one tunable
3 thin-film BST capacitor in that adjustable capacitance ~~group~~ grouping.

1 27. (Currently amended) The tuning circuit of claim 22, wherein the bias port further
2 comprises a bias resistor coupled between the tunable BST capacitor and the bias voltage.

1 28. (Currently amended) A tuning circuit comprising:
2 a means for reactance adjustment within an electrical circuit, further comprising
3 a first means for adjusting capacitance coupled between a first node and a
4 second node,
5 a second means for adjusting capacitance coupled between the first node and a
6 third node, and

7 a third means for adjusting capacitance coupled between the second node and
8 the third node,

9 wherein each means for adjusting capacitance ~~comprising~~ comprises at least
10 one means for capacitance having a high intrinsic capacitance density
11 and a field-dependent electrical permittivity, the means for capacitance
12 coupled between a first one of the nodes associated with the means for
13 adjusting capacitance[[,]] and a means for receiving a bias voltage; and
14 a means for electrically coupling the means for reactance adjustment in parallel with a
15 means for coupling and in series with a means for shunting in the electrical
16 circuit.

1 29. (Currently amended) The tuning circuit of claim 28, wherein the means for
2 electrically coupling includes

3 a first port coupling the means for reactance adjustment to the means for coupling and
4 the means for shunting; and
5 a second port coupling the means for reactance adjustment to the means for coupling.

1 30. (Currently amended) The tuning circuit of claim 28, wherein the means for
2 capacitance ~~comprises~~ a first tunable thin-film barium strontium titanate ("BST") capacitor.

1 31. (Currently amended) The tuning circuit of claim 29 30, wherein at least one of the
2 means for adjusting capacitance further comprises a second tunable thin-film BST capacitor
3 coupled between a second one of the nodes associated with the means for adjusting
4 capacitance and the means for receiving a bias voltage.

1 32. (Currently amended) The tuning circuit of claim 31, wherein the second tunable thin-
2 film BST capacitor is set to a value substantially equal to the first tunable thin-film BST
3 capacitor in the means for adjusting capacitance.

1 33. (Original) The tuning circuit of claim 28, wherein the means for receiving a bias
2 voltage further comprises a bias resistor.

1 34. (New) A tunable capacitive bridge configured to couple a ladder network comprising
2 a coupling element coupled in parallel with a shunt element, the tunable capacitive bridge
3 comprising:

4 a first tunable thin-film barium strontium titanate ("BST") capacitor coupled in
5 parallel with the coupling element and the shunt element; and

6 a second tunable thin-film BST capacitor and a third tunable thin-film BST capacitor
7 coupled in parallel with the first tunable thin-film BST capacitor and the
8 coupling element and the shunt element,

9 wherein the coupling element comprises at least one from a group consisting of a
10 capacitor, inductor, a resistor, and a transmission line.
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